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POSSIBLE FUTURE DEVELOPMENTS*

BY

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This is the last occasion on which I will be privileged to address a meeting of veterinary surgeons while holding a post in this country: for, in a few days, I retire from the post of Chief Veterinary Officer and take up another position in which my work will concern the control of the health and diseases of livestock in many parts of the world. I would not have been here to-day as my time in this country is now very short and I have still many commitments, but I promised your worthy Secretary some months ago that I would make a contribution at this meeting and I felt I must carry out my promise.

My address will be short: I have taken "Possible Future Developments" as the subject in order that I may discuss briefly the position of veterinary science and medicine as I see it and refer to some views that I have formed during recent years on the work which the profession may do and the position which the profession may or should hold in the world.

I am quite convinced that we, as a profession, are now more fully appreciated, not only in this country, but throughout the world. There has been a definite tendency in the past to regard the profession as an annex or appendage to agriculture, use being made of its services, depending upon the whims of the agricultural community and the economic position of agriculture, generally. The result has been that the advances in the profession have been slow and erratic, in most countries. This has also been reflected in veterinary education, for the provision of public funds for this purpose has been governed to a large extent by the attitude of those responsible and the advice they have received, not always from members of the profession but from others who have been assumed to be in a position to give advice. The result was that public funds were given sparingly and, in my view, in a manner quite out of keeping with the importance which should have been attached to the work which the profession should have been doing.

Fortunately, things have changed: money has been made available in greater amounts for veterinary education and for the furtherance of disease control schemes and we are now in a better position than ever we were to take our rightful place in the maintenance of livestock health and disease control.

What of the future—where are we going—how are we justifying the new trust that is being placed in us? What can we do to show the country and the world that our rôle in the livestock industry is of primary importance?

A. VETERINARY EDUCATION

The recent admission of the profession to university status is, in my opinion, one of the outstanding events in the history of the profession; it is one which, in time—and I hope, a very short time—will demonstrate the wisdom of those who have worked towards this end for many years. Naturally, the universities, which did not know us and which have many interests, looked with some degree of suspicion on a small body like ours, which had the ambition to break away from its self-centred, self-contained "one-portal" system and take its place in general university life along with not only other professions, but with the arts and sciences. However, we have been well received and as time goes on and we show, by our work, outlook and general performance, that we deserve all the encouragement that can be given to us, we will be accepted into full university life and faculty status. The indications are good, *e.g.*, there is now a Veterinary Faculty in the University of Liverpool and Queen's University, Belfast, has appointed a Professor of Comparative Pathology, who is with us to-day. Even the old University of Cambridge, in spite of its slow conservatism, has set up a Veterinary School which is being staffed largely by members of our own profession. At times, I am just a bit worried that in some veterinary schools, at least, the full advantage of a university life may not be possible or be available to veterinary students under present conditions. I mean universities in which the veterinary schools are at some little distance from other university buildings and where there is a tendency to remain aloof from other university departments. Apart from any possible educational advantages in the inclusion of veterinary science in a university—and I have some doubts on the advantages, except in the basic sciences, when we think on the high-class technical education that has prevailed in the past—the close association of undergraduates reading for degrees in a large variety of subjects is one of the important objects of a university life. Such an association is not only of much value to the veterinary student in his future career as a veterinarian and as a citizen; it is also important in its effects upon the future of the veterinary profession, in that the profession will become well known and its members considered to be on the same level as are graduates in the various arts and sciences. No longer will the veterinary profession be regarded as an appendage to something else—a body about which little is known and much suspected—it will take its rightful place as a body which has had the recognised type of training, *i.e.*, as shown by a university degree. We must, then, see to it that veterinary students at universities have the opportunity to partake of a full university life and leave their mark in general university affairs. This matter is largely in the hands of the teachers, although the governing body of the profession—the Royal College of Veterinary Surgeons—has also a part to play.

B. RESEARCH WORK

No scientific organisation such as the veterinary profession can continue to persist at high level without enthusiastic research workers who have ample and adequate facilities for their activities. While we have always had pioneers in research work who, by their careful observations and working under almost hopeless conditions, have added very considerably to our knowledge and to whom all honour and credit is due, within quite recent times an impetus has been given to the development of research work. It has been at last realised that research work pays dividends. It must be pointed out, of course, that for temperamental and other reasons every veterinary

*Address to the Western Counties Division, B.V.A., at Exeter, March 27th, 1952.

graduate is not suited to undertake it. However, it is surprising how many favour that type of life and, with encouragement, can be moulded into efficient research workers. In the short time that research work has been encouraged, considerable strides have been made and by the application of the findings of workers in other branches of science—sometimes of a highly fundamental nature—pictures are gradually being unfolded and explanations are forthcoming. There has been and still is a tendency for research work in veterinary subjects to be undertaken exclusively by members of our own profession and to exclude workers without a veterinary qualification. This is an outlook largely associated with youth. As one becomes riper in age and more tolerant in one's views, it becomes more and more obvious that scientific workers of many types are necessary to build up and complete the investigations essential to a full understanding of our problems. Again, it is held by some, that men and women with a veterinary training should be debarred from carrying out fundamental research work and should devote their activities solely to the applied side of the subject. While I support, quite strongly, the opinion that because of our training and outlook we are well equipped and fitted for applied work, I can never subscribe to the view that the door leading to fundamental research work should be closed against us. As one who has had to direct research work in large laboratories with many workers, it has become quite patent to me that, without the impetus of original and fundamental work, the best will not be obtained from some people. And, who knows, and I say this with all seriousness, what genius we may unearth among our young men and women, if they are given the opportunity to prove themselves? I believe thoroughly in allowing a person with a research bent to "have his head" for a bit and not to bind him down too closely to a routine job. Routine is an excellent training ground and it may suit some outlooks admirably: with some, however, it is valuable only for training purposes and then must cease.

Research work to-day in veterinary subjects covers an immense field: as time goes on, we will have the men and women with the necessary training, outlook and personalities to extend the work to its necessary degree. In my view, the time is fast approaching when we must consider very seriously setting up our own Research Co-ordinating Body, divorcing ourselves very largely from other such organisations but having still a close liaison with them. I am quite satisfied that then and only then will we obtain the type of support we need and will be able to develop our research activities to the fullest degree. I have no doubt that I can be challenged and criticised on this view, but after much experience and thought I am quite prepared to accept the challenge and, I hope, prove my point. We have a vast field open to us: it is our duty—more—it is our right to lead in all this work.

C. Application of Veterinary Science in the Field

All our education, all our research work, has a common objective, *viz.*, to improve the health of livestock, to control their diseases, and therefore to improve the food supplies in a country and to render these supplies safe for human consumption. For all this work we must have well-trained and well-equipped men and women.

We must first have an adequate service whose members can give their whole time to some of the important problems which concern the animal population in a country. The danger of the introduction of highly infectious diseases into a country like ours is always present, despite the precautions we are able to take. My experience now tells me that, no matter how we plan to control and eliminate endemic diseases in a country, we will be severely handicapped in our efforts unless we take every action to prevent the introduction of new infectious disease to a susceptible population. Our fear in this country centres around foot-and-mouth disease. We in this country will never be safe against its ravages until the infection can be controlled on a world-wide basis. Every outbreak of the disease in any country, especially in Europe, is a potential danger to this country and when the disease is to a large extent uncontrolled in some European countries, as pertains to-day, we see what can happen in our own country. You see the position we are in to-day. And while I am on this subject may I appeal to all veterinarians to exert the greatest care in the handling of animals which might be infected. There seems to be a tendency *not* to suspect foot-and-mouth. All too often does it happen that a wrong diagnosis is made of a condition which, while perhaps not typical, eventually is proved to be foot-and-mouth disease. By that time infection has been spread through the further work of veterinary surgeons. I appeal to all of you to *suspect*, rather than pass something over, and to convey your suspicions to the proper authorities.

While individual animals may be important in some respects, we must now, I think, consider diseases of livestock in the mass rather than as affecting individuals. Schemes for controlling disease must be viewed from this standpoint and the individual animal must be sacrificed. Most of our attention has been given to diseases of an infectious nature—diseases which are endemic in the country—and rightly so. Our future work must continue more and more on other types of disease. The control of infectious diseases must lie along the lines of diagnosis and elimination or of protection against the infection by the use of suitable agents with the longer term objective of eradication. I know it is a long-term view I am expressing when I talk about eradicating some of the present endemic infectious diseases; but we must always have that objective, no matter what method of control we apply. Rapid strides are being made in the control and eradication of bovine tuberculosis, thanks to the use of reliable tuberculin and the careful interpretation of the results of the tuberculin test. Brucellosis is being controlled by methods of immunisation and it is not too much to hope that one day we may see the end of that infection in the country. Swine fever can be controlled by immunisation and if infection can be kept from entering the country, a vigorous immunisation campaign would, in my view, soon result in total eradication of the disease. Some forms of mastitis lend themselves to control and eradication by the application of modern methods of treatment and prevention. Some parasitic infestations now also lend themselves to control, thanks to the active researches of the few who have devoted their time to the study of parasites of livestock. These are examples of conditions for which known control measures have been worked out and are being practised with the long-term view of total eradication.

We have still long lanes to travel in order to understand and devise methods of control of some other causes of ill-health. Some of the intricate physiological and pathological processes in some of the systems, *e.g.*, digestive, metabolic and reproductive, in cattle are but imperfectly understood and demand careful and prolonged attention. But surely and gradually, year by year, more information will become available and piece by piece the jig-saw will become a clear picture.

Veterinary surgeons working in the field have a big part

to play in all these schemes. They are the appliers of the latest discoveries in the control of disease. The country must rely on them to ensure that the best methods of health and disease control are being practised. No matter how good our educational system may be, no matter how wonderful may be the results of research and investigational work, all will be of little avail if the results are not applied. It is our duty to ensure that the results of recent discoveries are well tried not only in the laboratory or on a small field scale, but on a broader basis—and that, if satisfactory, they are adopted in our general day-to-day work. Only by so doing will we be giving our best to the agricultural community, to the country and to the world, and we will also be upholding the great work of the veterinary profession, a body that is now regarded with such respect throughout all countries. We must see to it, then, that we continue to progress and prove to the civilised world that we are worthy of the trust that is put in us and of the work that we have undertaken to carry out.

NOTE ON THE AGEING OF BOVINE EMBRYOS

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It is a remarkable fact that data concerning the accurate ageing of bovine embryos are very sparse in veterinary literature.

The older authors such as Gurlt (1873), Franck (1893), St. Cyr and Violet (1888), Albrecht (1914), de Bruin (1910), gave the lengths and weights of embryos at various stages in the gestation period; but their range of figures was too wide to have much value.*

Within recent years, an attempt has been made to put this important aspect of comparative embryology on a sounder footing, but owing to the shortage of suitable material a great deal still remains to be done. There are several reasons for this shortage; for instance, it is unusual to slaughter pregnant animals unless economic or humanitarian reasons dictate. Even when this happens the service dates are not always obtainable, and although abattoirs are a rich source of embryos, material of this kind is of no value when a precise history is required.

An obvious solution to the problem is to slaughter pregnant females of specific breed at intervals after service; but economic considerations preclude experiments of this nature, and one must be content, at present, with data obtained from the literature and from the few aged specimens that become available from time to time.

The correlation of certain measurements with the age of embryos has been of considerable value. The most obvious one is the age/weight relationship, but many others such as crown-rump length, dorso-ventral diameter and occipito-frontal diameter have been used with varying degrees of success. In the following notes, however, only the crown-rump length (C.R.L.) to age and weight to age relationships will be given.

* Gurlt, for instance, published the following figures :—

14–21 days ...	5–6 mm.	8 weeks ...	60–65 mm.		
28 ,, ...	8 ,,	9 ,, ...	80 ,,		
6 weeks ...	14–16 ,,	10 ,, ...	90 ,,		
7 ,, ...	24–30 ,,	11 ,, ...	110 ,,		

St. Cyr, Violet and Albrecht gave the weight at 14 weeks as 2 kg

Table I shows the dimensions and weights of 103 bovine embryos of known age, selected from the literature. From several points of view, the figures in this list are open to criticism. Until recently a standard measuring technique had not been adopted, and some of the data given by the earlier authors may not be comparable.

Nichols (1944) illustrates a useful measuring apparatus applicable to embryos over 100 mm. in length and gives figures for 100 Hereford embryos obtained from a packing house. He was able to compare 16 of his specimens with 16 of the aged specimens recorded by Winters (1942) and arrive at an age approximation, but these have not been included in the table.

Another criticism of Table I is that the specimens belong to a wide variety of breeds. It is a moot point, however, whether this has much significance during the early months of gestation, although breed has a definite effect on the birth weight (Asdell, 1946). The table, in fact, should be regarded simply as a general indication of growth-rate in the bovine species. It will be appreciated from the figures given that there is as yet insufficient material for a proper statistical study of the problem; but for the reader's convenience graphs are shown (Figs. 1 and 2), which illustrate the general trend in body length and weight throughout the gestation period.

TABLE I

Age of embryos (103) in days	Author	C.R.L. (mm.)	Weight (grammes)
14	Petersen (1937)	4·60	—
19	Winters (1942)	2·35	—
22	,,	5·18	—
24	,,	3·13	—
26	,,	3·05	—
26	,,	3·58	—
27	,,	8·26	0·09
28	Hammond (1927)	—	0·10
28	Buchem*	—	0·27
30	Winters	11·13	0·28
32	,,	11·90	0·35
37	,,	18·26	0·96
40	,,	22·80	1·55
45	,,	—	2·77
45	Bergmann (1921)	35	3·50
47	,,	34·06	3·25
50	Winters	38·50	4·94
51	Bergmann	49	7
54	,,	60	10·90
55	Winters	46·70	5·62
56	Hammond	—	9·20
56	Buchem	—	8·30
56	Rorik*	—	5
60	Winters	66	13·78
68	Bergmann	112	34
68	,,	143	120
70	Winters	94	37·25
73	Bergmann	170	215
77–80	,,	130	130
84	Hammond	—	87
84	Buchem	—	109
84	Rorik	—	77
89	Bergmann	160	185
90	Winters	164	159·8
91	Bergmann	155	205
93	,,	204	405
95	,,	210	355
99	,,	190	315
100	Winters	188	317·2
101	Bergmann	205	380
105	,,	218	450
106	,,	210	440
110	Winters	240	550

* As quoted by Winters (1942).

TABLE I—*continued*

Age of embryos (103) in days	Author	C.R.L. (mm.)	Weight (grammes)
112	Hammond	—	720
112	Buchem	—	599
112	Rorik	—	480
112	Bergmann	215	470
112	,,	240	650
112	,,	310	1,270
116	,,	270	870
118	,,	280	830
120	Winters	271	820
120	Bergmann	280	1,020
123	,,	360	1,750
127	,,	290	1,180
130	,,	297	1,130
130	Winters	312	1,390
131	Bergmann	310	1,300
133	,,	260	780
135	,,	320	1,470
140	Winters	326	1,807
140	Hammond	—	1,830
140	Buchem	—	1,712
140	Rorik	—	6,500
142	Bergmann	380	2,650
143	,,	380	2,670
150	Winters	368	2,746
153	Bergmann	290	1,090
160	Winters	437	3,562
161	Bergmann	470	3,450
164	,,	500	5,100
168	Hammond	—	2,700
168	Buchem	—	5,056
168	Rorik	—	325 (!)
169	Bergmann	550	6,300
170	Winters	485	7,144
185	,,	540	6,685
187	Bergmann	560	9,200
196	Hammond	—	10,380
196	Buchem	—	9,450
196	Rorik	—	23,000
196	Bergmann	600	9,600
198	,,	710	12,200
200	Winters	585	10,433
215	,,	700	16,102
215	Bergmann	740	15,100
218	,,	810	18,650
220	,,	750	19,300
224	Hammond	—	16,760
224	Buchem	—	16,075
224	Rorik	—	20,000
229	Bergmann	820	22,400
230	Winters	730	18,144
230	Bergmann	860	20,400
242	,,	870	25,000
242	,,	730	21,300
245	Winters	820	26,988
249	Bergmann	850	24,800
256	,,	950	33,400
260	Winters	870	31,298
261	Bergmann	950	39,500
278	,,	880	30,500
285	,,	900	34,500

The relative value of crown-rump length and of weight to age is worth considering. Increase in crown-rump length is due to the increase of cartilage and bone in a particular direction and tends to be more uniform than the increase in weight over a similar period of time, due to the fact that the different organs and tissues in the embryo have different growth-rates which are not coincident with one another (Barcroft, 1946). This differential growth-rate has been studied in sheep, by Wallace (1945), who found that organs such as the kidney, liver, lungs, bladder and brain make a larger proportion of their foetal growth earlier in the gestation period than do organs such as the spleen, thymus, intestines and the skeleton. Carlyle (1945) confirmed this in a study of

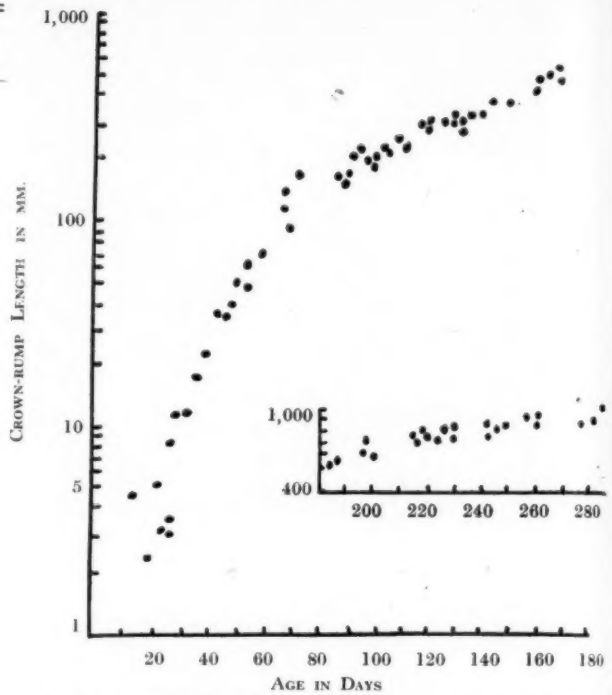

FIG. 1.—Crown-rump length/age relationship of bovine embryos.

the same problem. Apparently, no similar work has been done on bovine embryos.

Rehmet (1941) has attempted to age bovine and equine embryos on the basis of the heart rate by means of the electro-cardiograph. In the cow, he found that the foetal heart rate during the seventh, eighth and ninth months was 120 per minute, whereas in the sixth month it was 150 per minute ; but, at present, it does not seem that the method is likely to have a wide application.

Table II gives the measurements of five bovine embryos of known age collected during recent years. Numbers 1 and 5 were measured in the fresh state, the remainder after they had been in Bouin's fixative for varying periods up to about four hours after dispatch. As soon as a specimen was received in the laboratory, the amnion was removed and the straight crown-rump length measured on the same principle adopted by Nichols (1944). The weight was measured after excess moisture had been drained off on filter paper.

TABLE II

Embryo	Age (days)	C.R.L. (mm.)	Weight (grammes)
1	25	7	0·032
2	31	11	0·220
3	37	13	0·375
4	51	37	4·629
5	77	100	47·000

Regarding the first appearance of certain physical features in bovine embryos during the gestation period, it is possible to indicate the date by which they should have become recognisable. This knowledge can be a useful adjunct to ageing by means of the crown-rump length and weight, and Table III indicates the relation between some of these features and the age of the embryo. From a consideration

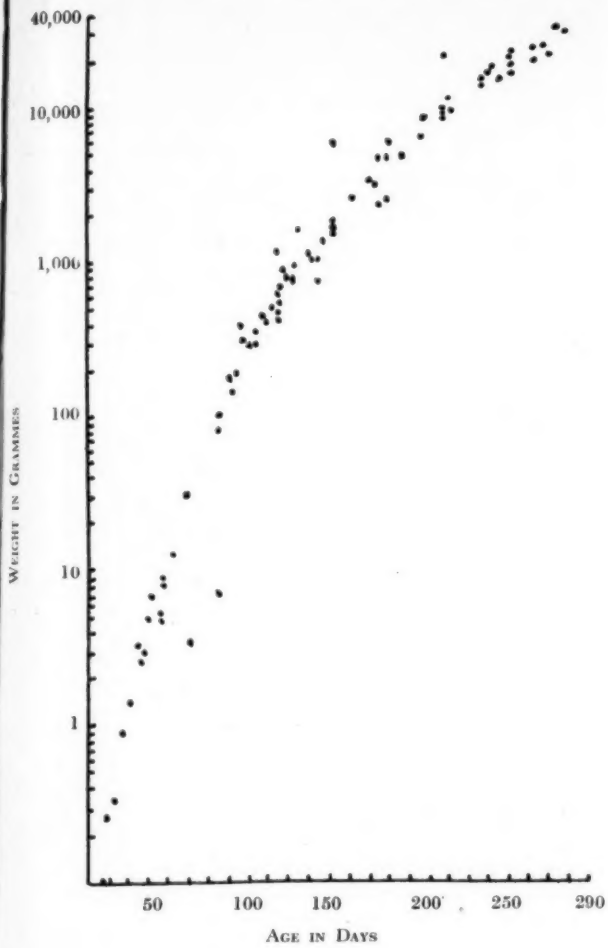

Fig. 2.—Weight/age relationship of bovine embryos.

of the data presented, it should not be difficult to arrive at a fair age approximation of any normal bovine embryo whose history is otherwise unknown; but the need for more material can hardly be sufficiently stressed.

Practitioners who are able to make measurements, on the lines indicated above, of any normal bovine embryos, especially if their history be known, are urged to publish their findings.

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Table III

Age in days	Physical characteristics	Author
26	Anterior limb buds have appeared	Winters (1942)
	Optic vesicles quite prominent	"
27	Posterior limb buds present	"
30	Nasal pits can be discerned	"
32	Limb buds undergoing differentiation	"
37	Ribs distinct	"
56	Ear buds just forming. Eye, dark spot under surface of epithelium. Mouth and nasal depressions formed. Digits quite distinct. Internally, epithelium of reticulum shows signs of honey-combing (50 mm.)	Hammond (1927) Lambert (1948)
59	Eyelids cover the eyes. Some ossification of ribs. Hind limbs nearly equal to fore limbs in length	Winters
84	Periople ring and top of hoof swollen. Horn buds visible. Ridges on inside of ear formed. Hair indicated by roughness around muzzle and lower lip	Hammond
90	First hair follicles observed	Winters
100	Horn cores first visible	"
110	Slight pigmentation of hair follicles	"
112	Eyes sunk deeper than at 84 days. Roughness around mouth and lower lip distinct	Hammond
	Small hairs around mouth and eyelid	Bergmann (1921)
	Amnion shows many small " pustules "	Hammond
140	Long fine hairs on muzzle, lower lip and eyebrows. Amniotic "pustules" larger and coalesce in places	"
164	Hair beginning to appear over horn cores	Bergmann
168	Downy hairs on horn cores, slight roughness at tip of tail. Amniotic " pustules " smaller and more scattered	Hammond
169	Hair round rims of ears	Bergmann
187	Hair on coronet	"
196	Eyes open. Meconium can be obtained from anus	Hammond
198	Hair on limbs to level of carpus and tarsus	Bergmann
215	All four legs covered with hair	"
218	Animal covered with hair	"
224	Hard translucent horn on hooves. Hair all over body and colour usually distinct. Amniotic " pustules " have disappeared	Hammond

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PRESERVING OUR BRIDLE PATHS

The British Horse Society reminds all horse owners that the official field survey of rights of way is now nearing completion and that all draft maps are due to be published by December 16th, 1952. Many of these draft maps are already on view to the public at the offices of the local Council, and during the next few months the public will have the opportunity of objecting should a path not be properly described on the draft map. Many existing bridle paths are overgrown or obstructed, but this does not prevent them from still being bridle paths, and they should be so described on the map and not simply as a right of way or as a footpath.

Members and persons interested in riding should remember it is their responsibility to ensure that these maps are correct. If there is any difficulty in checking the maps with the local council, it is suggested that they should communicate with Mr. R. V. Vernede of the Central Rights of Way Committee, 71, Eccleston Square, Westminster, S.W.1.

CLINICAL COMMUNICATION

CAESAREAN SECTION IN THE EWE

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Indications.—Non-dilation of the cervix ("ringwomb") and dystokia.

Ringwomb is a well-established, fairly common condition in this district, and in the vast majority of cases occurs in ewes which have previously had a lamb, though cases also occur in hoggs. The ewe when due to lamb starts expulsive efforts of variable strength, without result, rupturing the vagina or dying from shock or exhaustion from within a few hours to two or three days. Others (the minority) cease to strain and discharge parts of the foetus for some weeks and most die, presumably of toxaemia. By normal forceful methods of delivery of the lamb when that is possible (often the last resort of the owner), death of the ewe is the usual sequel. In all cases of ringwomb we have found that the *os uteri* will not relax appreciably, and in most cases discharge of the foetal fluid or approaching exhaustion of the ewe has occurred before presentation for operation. Necessity for operation is judged by telephone questioning of reliable shepherds or by visit, and is not easy, the tendency being to wait too long.

Of 39 cases presented, 34 were ringwomb cases, 30 in ewes, four in hoggs. Two were dystokias due to foetus of excessive size, one due to dry triplets in a contracted womb, one due to malposition of the foetus and one undertaken at the owner's request, which proved to be a headless monster, all these being in ewes.

Risk of Infection.—This district is saturated with Clostridia, *Cl. chauvoei*, *Cl. oedematiens* and *Cl. septique* having been recovered from many flocks and commonly causing death of the ewe after lambing.

Using the technique about to be described, we found no other bacteriological risk, except in occasional benign skin abscesses.

TECHNIQUE

This was standardised in order to develop familiarity as rapidly as possible, and therefore only the right flank approach was used. After preparing the skin, paravertebral anaesthesia, using 5 c.c. 5 per cent. procaine hydrochloride at each of four sites, was employed. A 2-inch 18 or 19 B.W.G. needle was found most satisfactory. The sites were the posterior border of the last rib and the transverse processes of first, second and third lumbar vertebrae, approximately 1 inch from the mid-line, the bone being struck in each case and injection made above and below it.

The ewe was restrained on her left side on a small table, the operative site prepared in the normal manner and large cloths fixed. A 6- to 8-inch skin incision was made from a point approximately 2 inches antero-ventral to the external angle of the ilium, over the flank, straight towards the mid-line. The muscle layers were separately and similarly incised, the larger vessels being picked up in forceps. The peritoneum was incised to reveal the small intestine, which was fairly readily pushed forward and was packed with a cloth if necessary. The pregnant horn or one of the pregnant horns was grasped, generally the hocks of the lamb falling between the thumb and finger, and drawn through the incision, which was thus effectively closed. In cases with dead or putrid lambs, indicated by an atonic uterus, the area was packed with sterile drapes, although when contamination occurred the rate of survival was not altered. An incision in the horn was made on the avascular border avoiding cotyledons and the narrower part of the horn, and the foetus withdrawn.

We found it most important to have a competent lay assistant (previously instructed) to dry and revive the lambs, which appeared to require more attention, especially until dry.

In nearly all cases the foetal membranes were left *in situ*, and were discharged normally, usually within a few hours; one doing so before the operation was completed. In a few cases the membranes, although separated, did not drop away but were removed by gentle traction from the outside, sometimes by the owner, up to 48 hours afterwards.

The uterine incision was closed with a Czerny-Lembert suture, using No. 1 chromic catgut, after inserting one 5-gramme tablet of Trinamide (M. & B.), and the uterus replaced in the abdominal cavity. The peritoneum and muscle layers were included in two Mitchell double-loop sutures using No. 8 nylon, tied off on rolled gauze. [These are made by passing the needle down through skin, muscle and peritoneum, starting about ½ inch from the skin edge, across to the other side and up through peritoneum and muscles, down through muscles and peritoneum of the same side and back across to the first side then up through peritoneum, muscle and skin to end alongside the starting point, and require much less time than their description.] These were not closed, however, until a single continuous suture had been used to bring the muscle edges together using up the ampoule of catgut. The skin was first closed with interrupted nylon sutures, but this was soon changed to Michel's clips for speed.

After-treatment consisted of dusting the wound once daily for three days with a wound powder, and giving one 5-gramme tablet of Trinamide per day for three days, including the day of operation. Sutures were removed in 7 to 10 days, frequently by the shepherd, Michel's clips here being advantageous.

Ewes which did not immediately take to their lambs (the minority) were confined with them. Ewes were able to walk straight off the table and were not especially housed, often being turned straight into the field with their lambs.

All but three cases were operated on in the surgery for convenience, and all cases were given 10 c.c. *Cl. chauvoei* anti-serum (B.W.) and 2 c.c. *Cl. oedematiens* refined anti-toxin (B.W.) as early as possible before operation.

Antihistaminics, pituitrin, penicillin and streptomycin were used occasionally as considered necessary.

RESULTS

Of 39 cases, seven died, six of which were clinically cases of blackleg, and five of these were on farms known to harbour blackleg. Two of these cases were examined bacteriologically, one proving to be *Cl. septique* and the other with no definite result. In most cases these ewes had been handled by the shepherd many hours before serum was given.

In 11 cases the foetus was putrid; only one of these ewes died of toxaemia and this ewe had been lambing for 48 hours. Some lambs were completely disintegrated, emphysematous and "stinking," but survival and recovery of the ewe was unimpaired. Thirty-four live lambs were recovered, of which nine died, some being a weakly twin or triple.

NOTE.—In addition to the above, the following were presented for operation:—

One ewe, which died from exhaustion on arrival at the surgery.

One ewe, having been comatose for 14 days with pregnancy toxaemia, became much brighter after operation, but died the same day.

One ewe was presented with the rectum herniated through the vagina and died during operation. The uterus and vagina were extensively split.

One ewe was presented with total herniation of the bowel through the prolapsed vagina. She was shot, bled, opened and two live lambs removed, which were reared successfully on other ewes. The carcase was salvaged.

REMARKS.—We found this operation to be simple (the operating time being about one hour), reliable and a most satisfactory approach to the problem of ringwomb and prolonged correction of dystokia, the survival rate being high. After-treatment is minimal and the ewes show very little after-effect, some ewes being exceedingly difficult to catch within two days of operation. Devon closewool, Exmoor horn, Cheviot, Devon longwool and mongrels were included. We have found it advantageous when operating on the farm to carry almost the entire surgery, one case being carried out by the light of three candles, the ewe rearing her two lambs successfully, however !

CATTLE BAN FOR AREA OF S. RHODESIA: TSETSE-FLY PRECAUTIONS

The Salisbury (S. Rhodesia) Correspondent of *The Times* reports that to check the advance of the tsetse-fly into northern Mashonaland, the Southern Rhodesian Government is to create a buffer strip by clearing Crown land and the Urungwe native reserve of all cattle. As well as contracting disease from the fly, cattle act as hosts to it. Owners of cattle unfit to be moved from the reserve or dying before or during the move will be compensated at current market rates. To compensate for the economic loss from the removal of cattle from the reserve, which comprises nearly 500,000 acres, a big programme of agricultural development is to be carried out. The reserve will be kept free of cattle for at least five years.

* * * * *

LIVESTOCK IN ENGLAND AND WALES

A continuance of the decline in total cattle and calves is shown in the provisional results of the livestock census held for England and Wales on June 4th this year, the only increase being in heifers in calf. The aggregate reduction in cattle and calves is 191,000, of which 130,000 are cattle between one and two years old.

The sheep population in England and Wales has now fully recovered from the losses in 1947. The increase this year is 1,106,000, which represents an 8 per cent. rise. Breeding ewes are substantially improved, while the increase of 765,000 lambs reflects the favourable lambing season enjoyed in most parts of the country.

Pigs have expanded in number by 27 per cent., the aggregate of 3,807,000 being the highest figures recorded for 17 years.

Poultry stocks have also improved, fowls by over 1,000,000 more.

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F.A.O. AGRICULTURAL RESEARCH PLAN

In order to encourage co-operation in agricultural research work and to facilitate the exchange of information between European countries, the Director-General of F.A.O. has sent invitations to European member nations to meet in Rome on September 10th to 12th.

Various methods of recording research work will be discussed and it is hoped that as a result a system of recording research information will be adopted in Europe. By this means research workers in one country could readily find out what their colleagues in other countries were doing in related subjects and thus obtain the benefits of their results and experiences.

ABSTRACTS

The Nutritive Value of Colostrum for the Calf*

6. Working with strains of *Bact. coli* isolated from cases of white scour in calves, the author was able to confirm previous observations that there is a close relationship between the precipitation reaction and the agglutination of the " K " antigen.

Mice could be protected from infection by *Bact. coli* with the homologous " K " serum thereby revealing the specific nature of these antibodies. As a result of these observations a method became available for classifying strains of *Bact. coli* and much useful knowledge can now be acquired regarding the epidemiology of any particular outbreak of white scours.

The transference of strains of *Bact. coli* from calf to calf in any community can thus be demonstrated. Under field conditions where calves from different sources are frequently brought together serologically unrelated strains are to be expected.

From the practical point of view it is concluded from these observations that white scours can be caused by different races of *Bact. coli* whose pathogenicity is influenced by varying environmental conditions.

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7. It having already been shown that the protective qualities of colostrum lay mainly in the lactoglobulin fraction, the authors have attempted in this work to establish that the "K" antigens of *Bact. coli* are present in colostrum and are highly important in protecting the calf. It has also been shown that equal protection was given to the calf by the globulin-containing whey as by the whole colostrum—which indicates that the protective action of colostrum is of the nature of a specific immunological character.

The test mice were inoculated with 50 LD of the test organisms intraperitoneally, followed two hours later by 0·5 ml. of diluted colostral whey by the same route.

During these observations further evidence was secured to confirm what was doubted in some quarters, namely, that *Bact. coli* is an important cause of white scours in calves. This organism was isolated from the jugular blood of two sick calves which died shortly afterwards. Whilst there may be extraneous precipitating causes it would seem that *Bact. coli* is the killing agent in most cases.

The experiments confirmed the presence of " K " antigen in the colostrum which protected calves, but where calves were dying in an epidemic of white scours " K " antigen was deficient.

N. S. B.

* **The Nutritional Value of Colostrum for the Calf.** 6.—The K. Antigens of *B. coli* ; 7.—Observations on the Nature of the Protective Properties of Colostrum. BRIGGS, C., *et al.* (1951.) *Brit. J. Nutrit.* **5.** 349–355 ; 356–362.

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Orf in London*

Eight cases of orf in London are described, six occurring in meat porters, one in a butcher and one in a housewife. They gave a history of handling sheep heads from Southern Scotland, the lesion developing on the hands in all cases. Spontaneous recovery took place in five to eight weeks and was uninfluenced by treatment with chloramphenicol or aureomycin.

A. W. G.

* **Orf in London.** HODGSON-JONES, I. S. (1951.) *B.M.J.* No. 4710. 795–796 (8 refs.).

Relationship of C.F. and Antihaemagglutinating Factors Against the Viruses of Mumps and Newcastle Disease*

The authors confirmed an increase of a heat-stable factor with haemagglutination inhibiting activity (H.I.) against Newcastle disease (N.D.) in the sera of patients convalescing from mumps. Increase in titre of heat-stable factor was also demonstrable by complement-fixation (C.F.). Of 15 pairs of sera from cases of mumps, 12 showed four-fold or greater rises of titre either by H.I. or C.F. tests, six showing such rises by both tests. Of paired sera from other virus diseases, none of 55 pairs showed rises by H.I. test, while one of 49 satisfactorily tested pairs showed a rise by C.F. test. The pair which showed no rise of antibodies against mumps was obtained from a case of acute pericarditis. With 66 single sera from normal persons, 10 had C.F. antibody against N.D. of which eight also had C.F. antibody against mumps. One of the two persons having antibody against N.D. only, developed severe mumps two years later, so that the antibody against N.D. was not associated with recovery from mumps. Results are explained by assuming that N.D. and mumps have an antigen in common. The presence of N.D. antibody only in three sera may have resulted upon recovery from human infection with N.D. or other diseases than mumps. Serologic diagnosis of N.D. in man must be made with caution.

A. W. G.

* **The Relationship of Complement-Fixing and Antihaemagglutinating Factors against the Viruses of Mumps and Newcastle Disease.** Jordan, W. S., & Feller, A. E. (1950.) *J. Lab. Clin. Med.* **36**. 369–377. (17 refs.)

* * * * *

Field Use of Avianised Distemper Virus*

One hundred dogs, believed susceptible to distemper, were vaccinated with Cabasso and Cox attenuated distemper virus, produced from virulent virus by passing it more than 26 times on the chorio-allantoic membrane of chick embryos. All remained free from symptoms referable to vaccination. Of 26 known to have contact with distemper after vaccination, all resisted infection including eight kennelled with a typical case of hard pad. The authors consider avianised virus is "a safe, effective product for the immunisation of unexposed dogs."

A. W. G.

* **Preliminary Report on the Field Use of Avianized Distemper Virus in 100 Dogs.** Scanlon, E. J., & Fisher, G. W. (1951.) *Vet. Med.* **46**. 432–434 (7 refs.).

Weekly Wisdom

Therefore Aristotle observes, "That the nature of everything is best seen in its smallest portions." Whence he seeks the nature of a commonwealth, first in a family; and so the nature of the world and the policy thereof must be sought in mean relations and small portions. The magnetic virtue of iron was not first discovered in bars, but in needles.—Bacon's "Advancement of Learning."

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Poultry shows and sales may now be held under licence in Lancashire, as in the rest of the country. The special restrictions on certain parts of the county have now been lifted by the Live Poultry (Restrictions) (Amendment) Order, 1952. This now brings Lancashire under the same fowl pest regulations as the rest of the country.

BRISTOL UNIVERSITY SCHOOL OF VETERINARY SCIENCE

HONORARY DEGREES CONFERRED AT THE UNIVERSITY

Minister Opens Veterinary Laboratories at Langford

In our issue of August 9th we made preliminary reference to an event of great significance in the development of veterinary training and research in the West of England: the opening by Sir Thomas Dugdale, Minister of Agriculture, of the new veterinary laboratories and field station of the University of Bristol School of Veterinary Science, at Langford House, Langford, Somerset, and the associated prior proceedings, also on July 29th, in the Great Hall of Bristol University. At the latter the Honorary Degree of D.Sc. was conferred on Sir Thomas Dalling, Chief Veterinary Consultant to F.A.O., Rome, and Past-President of the Royal College of Veterinary Surgeons, and on Professor J. G. Wright, Professor of Veterinary Surgery in the University of Liverpool and President of the R.C.V.S. They received their degrees from Sir Philip Morris, the Vice-Chancellor of Bristol University.

Proceedings in Congregation

This was a memorable occasion in the life of the new School. There was a colourful ceremony in the presence of the Lord Mayor (Alderman V. J. Ross), the Minister of Agriculture (Sir Thomas Dugdale) and a distinguished company.

The procession included, besides the Vice-Chancellor, Sir Robert Sinclair, pro-Chancellor; Professor G. C. Field, pro-Vice-Chancellor; Mr. W. R. Verdon Smith, Chairman of Council; Mr. H. G. Tanner, Treasurer; Alderman Henley Evans, Chairman, General Purposes Committee; Professors N. F. Mott, D. G. James, R. Milnes Walker and A. G. Pugsley; Mr. H. C. Butterfield, Registrar; Colonel C. M. Singer, Bursar, and D. C. Albany Smith, Finance Officer.

At the congregation (in the Great Hall of the University) the degree of D.Sc. (*Honoris Causa*) was awarded to Sir Thomas Dalling and Professor John George Wright. The graduands were presented to the Vice-Chancellor, Sir Philip Morris, by Professor Mott, Henry Overton Wills Professor of Physics and Dean of the Faculty of Science. In his oration Professor Mott referred to the eminence of Sir Thomas as a scientist who had contributed substantially to our knowledge of animal diseases and he made particular reference to his work on lamb dysentery and the fundamental and practical significance of the researches into this disease. Sir Thomas, said Professor Mott, had become "the Flying Scotsman of the world's veterinary air force" since he left the post of Chief Veterinary Officer of the Ministry of Agriculture to become Chief Consultant to the Food and Agriculture Organisation of the United Nations.

In presenting Professor Wright he made references to his eminence as a teacher and his pioneer work in the field of veterinary education which had led to the establishment of a Faculty at the University of Liverpool of which he is the first Dean. His ability as a teacher was renowned and in some regards hardly compatible with his reputation as an anaesthetist for he was never likely to send his students to sleep!

The Vice-Chancellor's Address

Sir Philip Morris, the Vice-Chancellor, then gave the following address:—

This ceremony in which we are all now taking part marks a notable step in the life of the University and an important development in a great profession, that of Veterinary Science. Five years ago, in anticipation of a new Act of Parliament, the University began preparations for the establishment of a School of Veterinary Science. Three years ago that School was inaugurated by the then Minister of Agriculture, and we are glad to have the present Minister of Agriculture to play the principal part in our ceremony this afternoon. To-day the

TOP: L. to R.—Dr. W. S. Gordon, Messrs. D. W. Menzies, J. N. Ritchie (Chief Veterinary Officer), D. L. Stewart, Dr. W. R. Wooldridge, Dr. A. W. Stableforth, Sir Thos. Dalling, Professor J. G. Wright (President, R.C.V.S.), Mr. A. J. Wright (President, B.V.A.) and Professor C. W. Ottaway.

INSET: Professor F. Blakemore, D.V.SC. (LIV.), B.V.SC. (BRISTOL), M.R.C.V.S., D.V.S.M., Director of Veterinary Studies, University of Bristol.

AT FOOT: The Minister of Agriculture, Sir Thomas Dugdale, unveils a plaque outside the Conference Block at the opening of Bristol University Veterinary Laboratories at Langford, near Bristol. L. to R.—The Minister, Professor F. Blakemore, Mr. W. R. Verdon-Smith (Chairman of Council), Sir Philip Morris (Vice-Chancellor).

(Photos by courtesy of "The Farmer and Stock-breeder.")

facilities which have been provided for clinical studies at Langford are to be officially opened and students will take possession of them at the beginning of next term.

On this occasion the University, with the full support of the City of Bristol, which is evidenced by the gracious presence of the Lord Mayor, welcomes those who have come from far and near to grace the occasion.

Many scientific pursuits fundamental to the study and advancement of veterinary science, were already practised in the University before the Veterinary School was inaugurated. We nevertheless lacked that intimate knowledge of the requirements of the profession which must come, if it comes at all, from the application, by men of great ability, of profound scientific knowledge to the problems of veterinary practice. Sir Thomas Dalling and Professor Wright, upon whom the University to-day confers the highest honour in its power to bestow, filled this important breach, and with rare judgment and wisdom gave the expert assistance and advice which were so greatly needed. In making them to-day honoured members of the University we confer distinction upon ourselves and we hope make them aware of our appreciation of their services.

So far as materials are concerned, whether in the form of buildings or equipment, the Veterinary School in this University is, though many additions in the future will be necessary, well provided. But a School in a University is more than an affair of bricks and mortar and apparatus and equipment. In the last resort its quality depends upon its staff, its students and its friends, both professional and lay. In its staff we think it to be most fortunate and both of the Professors, and some other members of the staff, owe much of their competence, and no doubt also some of their shortcomings, to Sir Thomas Dalling and Professor Wright. No trouble or effort has been spared in selecting each member of the staff and the University, justifiably, has every confidence in them.

The University at large has given its full support and co-operation in this important development. The heads of many existing departments gave unsparingly of their services in the early days as a matter of devotion to anything of importance to the University, but latterly because of the solid advantages to the University as a whole which the development of veterinary subjects has brought. We have now had enough experience to know beyond doubt that the University as a whole has gained by the inclusion within it of a School of Veterinary Science, and it is the hope of all of us that the School and the profession with which it is associated will gain, at least commensurately.

Until recent years the relationship between the Universities and the veterinary profession has been too meagre when it is remembered how much effective professional practice depends upon fundamental science, and how important are the services to be rendered by the profession to the national and world economy. The University has had the most cordial relations with the Royal College of Veterinary Surgeons on all matters whether academic or professional, and we owe a great debt to the College and to its officers. It is therefore a matter of great satisfaction to the University that the eminent veterinary surgeons honoured here to-day should be the Past-President and President respectively of the Royal College of Veterinary Surgeons. Thus is an indissoluble alliance between the Royal College of Veterinary Surgeons and the

University of Bristol confirmed and cemented. If the University and the Royal College have not become entirely members one of the other, they now share and command the loyalty of a number of common members.

Important amongst the friends of a new School of this character must necessarily be those who are engaged in veterinary practice, not only in the West Country but elsewhere, and all who gain their own living, and by so doing enable us also to live, in the agricultural industry. For many kindnesses and much co-operation already received I express the warm thanks of the University, with the confident feeling that on this occasion gratitude is also the expectation of many more favours still to come. We hope and expect to be of service to veterinary science, agriculture and the country at large by encouraging and developing fundamental work natural to a University, and we look confidently to those engaged in veterinary science and agriculture to afford that help, encouragement and occasional criticism without which the best academic efforts are doomed to sterility.

This is not the time nor the occasion for a long address. It is, however, fitting that we should be reminded on an occasion like this, as we have been by the Dean of the Faculty of Science, of great services already performed and of great work still being done, and that we should at the same time do honour to two eminent scientists. They both deserve a large share of the credit for what has so far been achieved in this University and this we recognise by admitting them as Doctors of Science today. In so doing we bear constantly in mind that it is for us to ensure that the School does not develop in the future, faults and defects for which they might, however unjustifiably, be held to be partly to blame. Much has been invested in this School of Veterinary Science because much is expected of it, and I have no doubt that Professor Blakemore and his colleagues are determined that all these expectations shall be fulfilled.

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Following the Degree Ceremony the new graduates, together with representatives of the University, of the veterinary profession and of other interested bodies, were entertained to luncheon.

Replying to a toast in their honour proposed by the Vice-Chancellor, Sir THOMAS DALLING referred to the unprecedented honour afforded by a great University of a day devoted entirely to veterinary science alone, and Professor WRIGHT to the work of a previous Vice-Chancellor of Bristol (Dr. Loveday) and his Committee in the interests of the veterinary profession.

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Inauguration of a Veterinary Centre for the South West

OPENING CEREMONY AT LANGFORD

In the afternoon a ceremony, as pleasing as it was impressive and yet with the happy informality implicit in our group picture of some of the participants, was held at Langford, where a company of over 500 saw the Minister of Agriculture, Sir Thomas Dugdale, formally open the new veterinary laboratories.

Those present included Sir Robert and Lady Sinclair, Mr. and Mrs. Verdon Smith, Sir Donald Vanderpeer, Sir Edward Hale, Lord and Lady Waldegrave, Sir Arthur and Lady Hobhouse, Mr. and Mrs. H. G. Tanner, The Lord Mayor and Lady Mayoress (Bristol), Sir Thomas Dalling (Chief Veterinary Consultant, F.A.O. of the United Nations), Sir Weldon Dalrymple-Champneys, Professor and Mrs. Skene, Mr H. W Dawes, Professor J. G. Wright (President of the Royal College of Veterinary Surgeons and Mrs. Wright, Mr. A. J. Wright (President of the British Veterinary Association), Dr. Loveday, Mr. J. N. Ritchie (Chief Veterinary Officer, Ministry of Agriculture), Mr. W. G. R. Oates (Secretary and Registrar, Royal College of Veterinary Surgeons), and Dr. W. R. Wooldridge.

The centre is intended to serve the south west and it is proposed to give the best possible service in theory and practice. Three organisations are concerned—the Ministry's Veterinary Advisory Service, the Somerset Cattle Breeding Centre and the University Field Centre.

Mr. W. R. VERDON SMITH, Chairman of the University Council, presided, and in introducing the Minister, was loudly applauded for his references to Dr. Thomas Loveday, sometime Vice-Chancellor of the University, who gave his name to the Loveday Report on Veterinary Education.

Professor F. Blakemore (Professor of Veterinary Medicine and Director of the veterinary laboratories) then gave an account of the developments at Langford.

Professor BLAKEMORE said: The development of the Veterinary School of the University has been proceeding actively during the past three and a half years. The first requirement of the five years' course was to provide accommodation for those pre-clinical subjects which could not be taught in existing University departments and a building was therefore erected on the University site to meet the needs of Veterinary Physiology and Anatomy. Our most advanced students are now entering the fourth year of the course. But veterinary science, dealing as its does in the main with farm stock, must be provided with laboratories in the country where research can be carried out and clinical studies can be undertaken. Langford was acquired to meet this need and students will be in residence here during the fifth year of the course.

A medical school seeks its clinical material in the city but a veterinary school must look to the country for its supply. Because we have nothing comparable to the medical hospital system it has been necessary to arrange avenues of contact with agriculture and we are fortunate in having located with us on the estate the regional disease investigation laboratory of the Ministry of Agriculture and the North Somerset Cattle Breeders' Centre. Langford is, therefore, a veterinary centre in the wide sense, playing its part in education, research and service by an association of the University with a government department and an enterprise initiated by private enterprise.

The development of the estate has taken place in stages. In the first place it was necessary to decide what use could be made of existing buildings. They have all been used by adapting them as laboratories, service rooms and for animal accommodation. The old stables are now a conference room and my own laboratory was formerly a garage. Some new building has also taken place and in the main teaching and research block new work has been blended with the old. There will be an opportunity to see the equipment used in a modern veterinary school and study in the laboratories, demonstrations which give some indication as to the scope of our interest.

Veterinary science is devoted to the scientific study of animals, it has responsibilities for their welfare and the preservation of their health. With the ever necessary and increasing use of scientific methods in farming the demands on it are great, for agriculture is still our greatest industry. Bristol is one of the two new veterinary schools recommended as a national necessity and it has now developed to a stage where it can make a substantial contribution to agriculture.

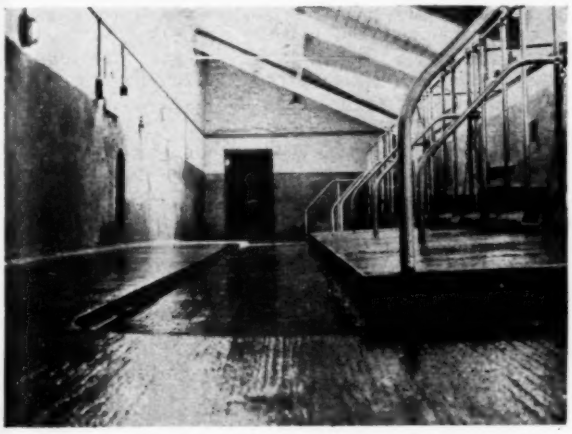
"Our greatest industry is still agriculture," concluded Professor Blakemore. "The possibilities are here. Let us use them to the full!"

The Rt. Hon. Sir THOMAS DUGDALE, Minister of Agriculture, then officially opened the laboratories, saying that with the emphasis to-day on the prevention of disease rather than the cure, it was important to maintain the high standard of education of veterinary surgeons so that there might be a constant flow of workers with a flair for research work in the laboratories.

In addition to the treatment of individual animals, the veterinary surgeon was being called upon more and more to control disease on a herd basis, said the Minister. The field in which he exercised his skill was a very large one, and would grow larger still, so veterinary medicine had to demand a high standard of skill.

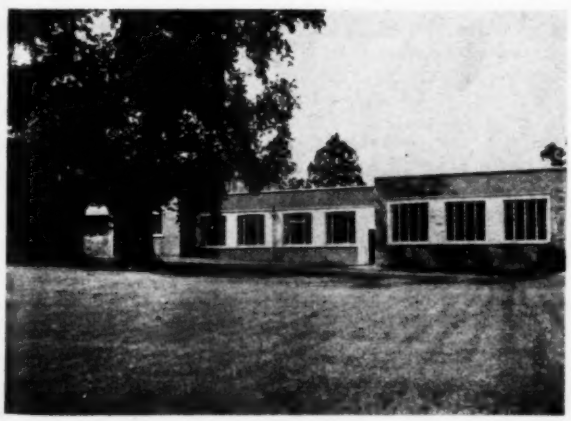
Steady progress against disease had been made in recent years and it had been due to the practical application of research. They all owed a great deal to the veterinary research workers, he continued, but the supply of teachers was also most important.

Langford House and New Teaching and Research Building.



Cowshed.

Bull Accommodation. Artificial Insemination Centre.



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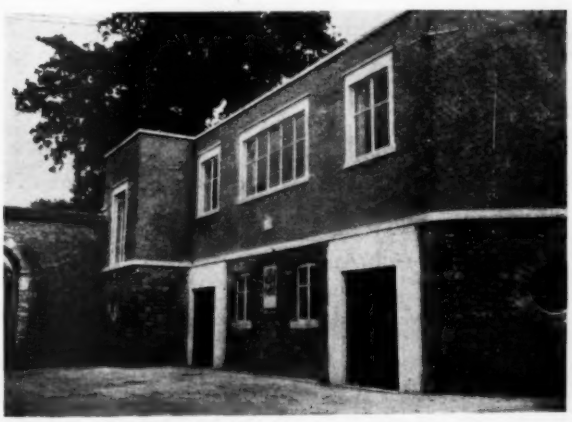

Museum and Conference Block.

Outlining the inception of the centre, Sir Thomas said it was nearly four years since Mr. Tom Williams, the former Minister, inaugurated the Veterinary School. The Committee who made the recommendations for improving veterinary services had as its Chairman Dr. Loveday, former Vice-Chancellor of the University, and they stressed the importance of having facilities for clinical teaching and research, and that a field station should be attached to the Veterinary School.

"No Mean Achievement"

The recommendation the Committee made would have far reaching effects. Three of the four schools which were not then in Universities had been linked up, and two new schools—at Bristol and Cambridge—had been established. That was no mean achievement, and the expansion had been carried out with the full support of the Royal College of Veterinary Surgeons, who were responsible for maintaining a high standard of training. A degree of veterinary medicine at Bristol University became a qualification to practise.

It was largely due to the foresight and enthusiasm of Dr. Loveday that they were opening the station on that site, said Sir Thomas. The three organisations sharing the premises could work with each other to their mutual advantage, and he congratulated the University on having an ideal site. The present Vice-Chancellor, Sir Philip Morris, had taken a personal interest in the School.

The students, said the Minister, were bound very closely with the farming community. During the war there were difficulties in employment in the profession, but that had now changed. The maintenance of health and a well-planned agriculture must be a permanent future policy, and the prevention of disease would play a great part in furthering that policy. A well-trained veterinary profession could exert a powerful influence on the prosperity of agriculture. As illustrations of this point, Sir Thomas Dugdale referred to the enormous difference made by the "S.19" vaccine against contagious abortion, the steady progress in the eradication of bovine tuberculosis and the increased use of penicillin in the control of mastitis. Everybody owed a great debt to veterinary research.

Special reference was made to the wisdom of locating the Veterinary Investigation Centre for the area at Langford and to the work of the Somerset Cattle Breeders' Association, a concern initiated by Messrs. Horlicks, Ltd.

The rôle of the veterinary surgeon in private practice in furthering greater productivity was no less important than the teachers and research workers and he could be of more help in the years ahead.

Sir Thomas was thanked by the Vice-Chancellor, Sir Philip Morris. Before making a tour of the buildings, the Minister unveiled a plaque outside the conference block commemorating the occasion.

X-RAYS IN THE SELECTION OF BREEDING PIGS

According to reports on work done at Cambridge by the School of Agriculture in conjunction with the Low Temperature Research Station of the Department of Scientific and Industrial Research, X-rays can help in the selection of breeding pigs. By their use the number of ribs and vertebrae can be counted, and they can also be used to measure layers of fat.

In normal pigs the number of ribs can vary from 13 to 17 and the more ribs, the longer the pig and the greater the proportion of lean mean to fat. The technique which has been developed, therefore, provides information which normally can be obtained only by killing the animal. Small pigs can be stretched out under the X-ray camera and bones counted.

The D.S.I.R. report states that the technique can also be used for judging pigs at shows. The equipment is commercially produced in this country and packs into a box which can be carried by one man. It plugs in to the ordinary electricity supply.

REPORT

FOOT-AND-MOUTH DISEASE RESEARCH AT PIRBRIGHT*

This interim report on the research in progress at the Foot-and-Mouth Disease Research Institute, Pirbright, Surrey, has been prepared by the Agricultural Research Council at the request of the Agricultural Improvement Council for England and Wales. Issued on Thursday last, it is stated further in a foreword by Lord Woolton, Lord President of the Council, that he had instructed that it be published and widely circulated, in view of the general public concern about the recent and serious outbreaks of foot-and-mouth disease in Great Britain and in the hope that public interest may be informed and stimulated; also that the report will assure the public that the work is being prosecuted with both vigour and competence.

In the introduction it is stated that a comprehensive report on the work of the Pirbright Institute (Director Ian A. Galloway, D.SC., M.R.C.V.S.) during 12 years is in preparation, but owing to the large number of investigations to be reviewed, it will not be ready before the spring of 1953. The results of many of these investigations, references to which are given in an appended list, already have been recorded in scientific journals. This short interim report gives only a broad general survey and does not attempt a detailed description of the experimental work.

Dealing first with the essential conditions for the study of foot-and-mouth disease, the report states that from the outset the staff at Pirbright concentrated on the introduction into their work of measurements as precise as is possible in dealing with difficult biological material. "As a result the Station has been largely instrumental in developing the techniques now in general use for the scientific study of the disease." It would not have been possible to do this work in a country where the disease is endemic, since its basic requisite is a supply of cattle which can be guaranteed to have had no previous contact with the disease and hence to have no residual immunity. In countries where the disease is endemic, as on the Continent of Europe, and in South America, repeated difficulties have been encountered in obtaining reliable results by reason of the uncertain clinical history of the animals used in experiments. While the workers at Pirbright have been helped by a readily available supply of suitable cattle resulting from the control of the disease in the United Kingdom, the rate of progress has, at the same time, been retarded by the precautions required to prevent the dissemination of the disease from an institute situated in a country free from infection and populated by highly susceptible cattle. . . . "It has been necessary to gain experience at Pirbright of the working of these complex precautionary measures on a limited scale before the isolation accommodation could be safely increased to allow for a larger number of infected animals and hence for a speeding up of the work. This stage has now been reached, and the finance has been made available, for a greatly extended institute."

Reference next is made to advances in knowledge of the relative susceptibility of different experimental animals.

In the past cattle and pigs were used almost indiscriminately as the test animals either for the detection of a

* Interim Report on Research Work on Foot-and-Mouth Disease at the Research Institute, Pirbright, Surrey (1952). Published for the Agricultural Research Council by H.M.S.O. and obtainable from York House, Kingsway, London, W.C.2, and provincial centres, price 6d. net.

virus or for estimating the immunising value of different vaccines, but there is evidence of species " adaptation " as between pigs and cattle. Since Waldmann and Pape in Germany in 1919 first demonstrated the possibility of infecting guinea-pigs with foot-and-mouth disease these animals have been used extensively for experimental work and also by some workers for detecting the presence of virus in suspect material, but different strains of virus originating both from cattle and pigs will not infect guinea-pigs with the same ease and regularity as they will their original host. Guinea-pigs are therefore unsuitable for detecting small amounts of virus in suspect material or for estimating the amount of virus in material to be used for making vaccines of known potency. They are, however, very useful for many exploratory types of experiment after the necessary adaptation of the virus.

More recently, workers at Pirbright have introduced a new experimental animal, the unweaned mouse. These mice have been infected readily with all the strains of virus originating from cattle which have so far been tested ; eight strains have been used and others are under examination. With the majority of these cattle strains it is possible to infect the unweaned mice with as small a proportionate dose as that required for cattle. Unweaned mice are also proving useful in the detection of small amounts of antibodies developing in the circulating blood of immunised cattle.

Identification of Different Types of the Virus

After referring to the identification of viruses O, A and C and to the specific nature of the acquired immunity, the report proceeds: " The early studies on the types of foot-and-mouth disease virus were carried out on cattle, but after guinea-pigs had been shown to be susceptible these animals were extensively used for determining the type of any sample of virus. This involved the adaptation of the virus to guinea-pigs by a number of passages, a very slow and unsatisfactory procedure when the classification of virus from a field outbreak was required. The next advance was made in this country when it was shown that a laboratory test known as the ' complement fixation test ' could be used for determining the immunological types of virus strains. Later this test was modified by German workers so that it could be used for the examination of material from field outbreaks in cattle and other animals. The usefulness of the complement fixation test has been demonstrated at Pirbright and its value proved by comparing the results obtained with those from tests using cattle and guinea-pigs. More precise methods for carrying out the test have been developed at Pirbright and applied to increase its range and accuracy. Provided that the sample from the field is suitable—if its virus content is too small it has to be passaged through cattle to get fresh material—it is now possible by this method to determine the type of virus involved within a few hours of the receipt of material from a suspected outbreak. This rapid diagnosis is proving of the greatest value in combating the disease.

" The Pirbright Institute has now established an organisation for the rapid classification of strains by this method and requests have come from all over the world for assistance in examining suspect material. These opportunities of examining material from other countries have been welcomed as providing information about the occurrence of outbreaks and the type of virus involved. It has to be recognised that the United Kingdom is subject to infection from other countries supplying us with meat, from countries whose ships come into our ports and from neighbouring countries in Europe with which we have many contacts. With the shortage of meat, supplies are being sought from new sources any of which may prove a source of infection. A knowledge of the conditions in these countries is therefore important for our own protection. These world epidemiological surveys have also provided valuable evidence of the means by which the disease is spread. A further result of this work at Pirbright has been to show that different strains of virus within each type differ in the severity of the disease they cause and the ease with which they spread. Not only is it of great importance in dealing with an outbreak of the disease to know these characteristics of the strain concerned, but it is also possible to explain some of the conflicting reports on control methods made on the basis of the observation of the results in a small number of cases. If the strain of virus causing the disease in the treated animals does not spread easily the method may appear good ; if it spreads rapidly the method may seem bad.

" For many years the United States, Canada—with the exception of the recent outbreak—Australia and New Zealand have been free of the disease and carry out no research work. They rely on Pirbright for advice and for the examination of samples of the virus from adjoining countries which present a potential danger, *e.g.*, the United States in their campaign to control the disease in Mexico.

" During the last 12 years the Institute has examined over 500 samples of material from field outbreaks in Great Britain, South and Central America, Canada, Africa, Palestine and European countries. In all these only three main types have been identified excluding those in Africa. The three types are those already described by Vallée and Carré and by Waldmann and Trautwein. From the African outbreaks three new types have been identified at Pirbright, known as S.A.T. 1, 2 and 3. It is important to keep a close watch on the distribution of these African types in order to try to prevent their spread to Europe.

Variant Strains or Sub-types of Foot-and-mouth Disease

"As the result of an extensive series of experiments at Pirbright, the occurrence has been established of strains of the virus which, while they belong to one of the recognised immunological types, show minor but significant differences when problems of immunity, such as vaccination, are being examined. They are classified by the Institute as variant strains if they show a difference in their behaviour not only in the complement fixation test but also in serum neutralisation test and in cross vaccination tests with the stock strain of the type. This classification has so far been made only at Pirbright. Vaccines prepared from these variant strains may not give the same degree of immunity against the stock strain of the type as do vaccines prepared from the stock strain itself ; equally the vaccine of the stock strain may not give full protection against the variant strain. The first indication of the existence of a variant strain was obtained whilst the Institute was helping the joint Mexican-U.S.A. Commission. All strains of virus do not differ to an extent which justifies their separate classification ; some appear to be immunologically identical.

" The largest collection of strains of foot-and-mouth virus in the world is held at Pirbright and provides invaluable material for research."

The next section of the report deals with the preparation and supply of hyperimmune sera for complement fixation tests and differential diagnosis. The Pirbright Institute provides the world supply of freeze-dried diagnostic and typing sera. The standard sera are prepared, in separate experimental units, against different types of the virus and freeze-dried so that they will withstand changes in tempera-

ture during transit. A charge is made for the sera and since 1949 the amount sold has brought in $10,000.

"In addition to the complement fixation test sera for foot-and-mouth disease, sera have been prepared for differentiating another virus disease occurring in North, Central and South America, vesicular stomatitis, which has clinical symptoms similar to foot-and-mouth disease. When the common symptoms of the two diseases are found in a country where vesicular stomatitis frequently occurs, it is of the greatest importance to be able to show quickly that it is not foot-and-mouth disease. A wrong diagnosis might permit foot-and-mouth disease to get a firm hold before it was finally recognised by its more serious effects. There are two types of vesicular stomatitis and a complement fixation test has been worked out at Pirbright which distinguishes between them. It was only by the use of these sera that the recent outbreak of foot-and-mouth disease in Canada was shown not to be vesicular stomatitis and the final diagnosis was made by an independent check on a sample sent from Canada to Pirbright. The rapid diagnosis of foot-and-mouth disease and the identification of the type of virus involved is essential where vaccination is used as a method of control, since it enables arrangements to be made for the immediate supply of the proper vaccine."

Comparative Study of the Virus and Antibodies

In this short section is summarised a particularly important feature of the immunological work at Pirbright. "For all critical experiments, and particularly those on the use of vaccines, it is necessary to know the strength of the virus used. A method for estimating this in virus originating from cattle has been developed at Pirbright, by inoculating the tongue of a bullock with different dilutions of the virus. Four dilutions are inoculated in four separate rows of five sites each. The strength of the virus is estimated by the dilution necessary to produce characteristic blisters at half the sites inoculated. Before this method could be generally adopted, trials taking several years had to be made with many strains and the results submitted to careful statistical analysis. The test is now universally accepted as the standard technique for determining the strength of foot-and-mouth virus and by its use research into many problems previously intractable has been made possible; it is used for the estimation of the strength of antibodies present in the blood of animals recovering from infection or after vaccination and for estimating the biological activity of different materials produced in fundamental studies of the physical characteristics of the virus and the antibody."

Development and Preparation of Vaccines

"In the last 10 years 135 vaccines have been prepared at Pirbright by eight different methods using strains of virus collected from eight countries. The characteristics of each of the vaccines have been determined. The work on vaccines has involved 75 major experiments and has required 5,000 cattle that have never been in contact with the disease.

"This work has shown the importance of knowing not only the type but also the strain differences of the virus before the right vaccine can be selected for successful immunisation. Research into this complex problem is continuing in the Institute; it will require the development and application of highly specialised techniques and much patient and systematic work. There is no short cut to the provision of vaccines which will give full protection. Methods of preparing, testing and storing of vaccines have been investigated but much more remains to be done.

"The standard method of preparing vaccines has been to infect cattle under experimental conditions with the virus against which protection was required and to prepare the vaccine from the infected animals. This was a lengthy and expensive method. *Frankel in Holland has now shown that the virus can be cultured in tongues of cattle slaughtered for food and a vaccine prepared from the cultured material. This method has been carefully examined at Pirbright and vaccines, using three different strains of virus, have been prepared by using both artificially infected cattle and infected excised tongues. Comparative tests were then made of the two sets of vaccines using enough cattle to give results of statistical significance. These showed conclusively that vaccines prepared by Frankel's method are comparable with those from infected cattle. No satisfactory comparison had been made before owing to the difficulty of getting 'clean' animals on the Continent. Pre-publication copies of the paper dealing with this work have been sent to all vaccine-producing centres in Europe. Another possible source of virus material for vaccine production has been suggested by preliminary tests on vaccines prepared from the tissues of virus-infected unweaned mice."

Establishment and Duration of Immunity

Work is at present in progress at the Institute to establish the time required to establish immunity with different vaccines at different concentrations and under different conditions; also how long the immunity lasts after it has been established. Here again the dose, the type of vaccine and the conditions associated with vaccination all influence the result. What has been definitely established at Pirbright and elsewhere is that the immunity gradually wanes. Present evidence suggests that full protection could be given for about four months. After that period an increasing proportion of vaccinated animals would become susceptible to the disease.

Consideration follows of biophysical investigations into the nature of the virus, for which the Institute is well equipped.

Studies of the Survival of the Virus in Meat and Offal

"Six large experiments have been carried out using infected cattle for the provision of meat and offal and other groups of cattle for testing the virus content of the different tissues. The earlier work had led to too much significance being attached to the infectivity of bone marrow. These more precise experiments have shown that there is equal risk of other tissue, including the lymph nodes, blood in the large vessels, liver, kidneys and the rumen, remaining infective for long periods." "These results," it is stated, "are important in demonstrating that boning meat gives no protection against the introduction of the disease. It has been shown that hanging meat and spraying carcases with lactic acid gives no effective control. Quick-frozen meat and its wrappings were also found to be more dangerous than meat frozen by ordinary methods or chilled."

Future Plans for the Pirbright Institute

A short section relating to the interchange of information with workers in other countries, with special reference to inter-visitation of personnel, precedes the intimation that a large expansion of the buildings and facilities at Pirbright

* Bull. Off. Internat. Etiz. Vol. 28, p. 155.

is planned. This includes more accommodation for animals in strict isolation, laboratories and other ancillary buildings. When these additional facilities are available the staff will be strengthened and the number of animals used for experiments at one time can be increased, with a corresponding speeding up of all investigations.

The report concludes: "These notes do not attempt to cover the whole of the work or to describe any part of it in detail. Work of great importance involving many animals and much tedious, and at the same time highly skilled work, is dismissed in a few lines. It has not been possible to show the exact part taken by the staff at Pirbright in investigations to which other workers have contributed, but in all that is mentioned Pirbright has played a major part. The reputation of the Institute is shown by the calls made on it from abroad (these have come from North and South America, Africa and Europe) and by the demand from overseas scientists to come and work at Pirbright."

NOTES AND NEWS

Diary of Events

Sept. 3rd.—Joint Meeting of the South Eastern and Sussex Divisions, B.V.A., at the Wellcome Veterinary Research Station, Frant, Tunbridge Wells, 6 p.m.

Sept. 7th—13th.—Seventieth Annual General Meeting and Congress of the British Veterinary Association, at Harrogate.

Sept. 11th.—Annual General Meeting and Dinner of the Royal "Dick" Alumnus Association, at Harrogate. (See Notice.)

Sept. 11th.—Meeting of the Society of Practising Veterinary Surgeons, at Harrogate (Majestic Hotel), 2.45 p.m. Meeting of Council, 2.15 p.m.

Sept. 12th.—Annual General Meeting of the Association of Veterinary Teachers and Research Workers, at Harrogate (Municipal Building, Council Chamber), 2.30 p.m.

Sept. 24th.—Meeting of the R.A.V.C. Division of the B.V.A. at the Equine Research Station of the Animal Health Trust, Newmarket, 11.15 a.m.

Oct. 8th.—Meeting of the Editorial Committee, B.V.A., at 36, Gordon Square, W.C.1, 2 p.m.; Executive Committee to follow immediately. N.B. *There will be no meeting of either the Editorial Committee or its Executive Sub-committee in September.*

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B.V.A. Handbook and Other Papers for Congress

During the past week there have been distributed to members, the B.V.A. Annual Handbook and copies of the papers to be discussed at the Annual Congress of the Association to be held at Harrogate from September 7th to 13th, 1952.

Any member who has not yet received these documents should inform the General Secretary at 36, Gordon Square, London, W.C.1.

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MINISTER OF AGRICULTURE TO SPEAK AT BANQUET

As we had the pleasure of announcing in our issue of last week, the Minister of Agriculture, Major The Rt. Hon. Sir Thomas L. Dugdale, BT., T.D., M.P., has accepted the invitation extended to him to attend the Annual Banquet of the British Veterinary Association to be held at the Hotel Majestic, Harrogate, on Wednesday, September 10th, and will propose the toast to the Association. Another notable feature of the occasion will be the presence of Sir James Turner, President of the National Farmers' Union, who will respond to the toast of "Our Guests."

PERSONAL

Births.—PEACOCK.—On August 22nd, 1952, at 35, Goldington Avenue, Bedford, to Sheila and Michael Peacock, a daughter.

SMITH.—On August 18th, 1952, to Dilys, wife of James Smith, M.R.C.V.S., Greystones, Chipping Hill, Witham, Essex, a sister for David.

Marriage.—TEBBUTT—SHELLEY.—On August 23rd, 1952, at Braintree, Essex, Norman Frederick Tebbutt, only son of Mr. and Mrs. Wilfred Tebbutt, Rose Cottage, Rothwell, Kettering, to Miss Evelyn Shelley, of Braintree.

TRIBUTE TO THE LATE MR. PETER BILLINGE

Mr. Peter Billinge, whose death in a road accident near Inverness we recorded with much regret in our last issue, came to this country from Kenya, serving with a Parachute Brigade during the war, where he gained the rank of Captain. Before his tragic death he had completed the third year of his studies as a veterinary student surgeon at the Edinburgh College. He was working in Inverness during his vacation with the Inverness firm of veterinary surgeons, Messrs. Maclennan and Riggs.

A correspondent writes to the *Inverness Courier*:—

"Peter Billinge, who was killed in a motor accident whilst driving his motor-cycle, was a young man we can ill afford to lose. Singleness of mind, enthusiasm for his work, and a great capacity for enjoying life, made Peter Billinge a young man of great promise. He was not one to work by the clock, and after duty-hours to waste his time in cinemas and at street corners, for he had his heart in his work, but for all that was utterly human and full of the enjoyment of life. He could well be an example to the youth of this country, as he combined hard work, enterprise and enthusiasm for his job."

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Wills.—Captain Clement Mervyn Barton, M.R.C.V.S., of Red Lodge, Overslade, Rugby, the former amateur steeplechase rider and breeder of thoroughbred racehorses, who died on May 26th last, left £5,278 4s. gross, £3,558 0s. 4d. net value.

Mr. Henry William Steele-Bodger, of 28, Lichfield Street, Tamworth, former President of the British Veterinary Association, who died on January 11th, left £36,007 gross, £25,821 net (duty paid £3,654). He left his veterinary practice at Bore Street, Lichfield, to his son Alasdair and a similar practice at Lichfield Street, Tamworth, to his son Michael, former England rugby football international.

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Appointments.—The Colonial Office announces the following appointments in the Veterinary Service: Mr. R. M. Arnold, B.SC., M.R.C.V.S., Veterinary Investigation Officer, Jamaica, to be Deputy Director (Livestock), Jamaica; Mr. K. D. S. Macowan, B.SC., M.R.C.V.S., Senior Veterinary Officer, Kenya, to be Deputy Director of Veterinary Services, Kenya; also that of Mr. E. P. Rice, M.R.C.V.S., Senior Veterinary Officer, Kenya, as Assistant Director of Veterinary Services, Kenya. Mr. J. G. Ross, M.R.C.V.S., D.V.S.M., Veterinary Officer, Cyprus, is appointed Veterinary Officer, Uganda, and as a first appointment there is intimated that of Mr. W. Hardie, M.R.C.V.S., as Veterinary Officer, Fiji.

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Capt. G. F. Banham's Successes at the International Horse Show.—At the International Horse Show held at the White City, Capt. G. F. Banham, M.R.C.V.S., rode his wife's hunter, Grandborough, to win the Challenge and Champion Lightweight hunter classes. Later this horse was placed reserve Supreme Champion Hunter of the Show.

Grandborough, ridden by Mrs. Fred Rimell, the owner's daughter, also won the Schweppe's Cup for being the best ladies' hunter in the Show.

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R.C.V.S. OBITUARY

BENNETT, Ralph, F.R.C.V.S., 73, Hangleton Road, Hove, late of Romford, Essex. Graduated London, July 12th, 1904; Fellowship December 11th, 1909. Died August 20th, 1952; aged 69 years.

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FOOT-AND-MOUTH DISEASE

Since our last announcement outbreaks of foot-and-mouth disease have been confirmed at Cheltenham, Glos., Lewes, Sussex, and Chilham, Kent.

The latest compensation figure issued by the Ministry of Agriculture, £2,651,460, covers 550 outbreaks to August 2nd. Since then only 13 outbreaks have been reported.

CANADA DECLARED FREE

On August 19th Canada was officially declared free of foot-and-mouth disease by Mr. J. G. Gardiner, Minister of Agriculture. The disease was discovered in Southern Saskatchewan on February 25th,

and no new outbreak has been reported since May 4th, when the last infected herd was slaughtered. Test animals (calves and pigs) have been kept in all infected and contacr areas for 60 days or more, and none of them has shown any sign of the malady.

"To-day's action," states the Ottawa Correspondent of *The Times*, "removes all quarantines and restrictive measures. In all, 1,343 cattle, 294 swine and 97 sheep were slaughtered during the epidemic and compensation for them paid to the farmers. Only 21 out of 580 rural municipalities were involved in the quarantine and there was active infection in only five of these."

The Disease Under Control in Austria

The Veterinary Department of the Austrian Ministry of Agriculture states that the epidemic of foot-and-mouth disease which spread alarmingly in parts of Austria after November, 1951, has now been brought under control. The number of farms affected has dropped from 2,410 on April 2nd to 395 on August 20th, districts from 29 to 15, and villages from 289 to 71. All of these are in Lower Austria, the Burgenland and the neighbourhood of Vienna. No new case has been reported from the other provinces for some time

"The methods of control adopted here," reports the Vienna Correspondent of *The Times*, "consist of rigid isolation of any district in which an outbreak is reported, inoculation and the destruction of wild birds and animals, including sparrows, starlings, foxes, weasels, stoats, martens, rats and mice. All public places, including churches, schools, shops and inns, are closed. All farm animals likely to be affected are inoculated. Dogs, cats and poultry must be kept within the boundaries of the segregated area, the inmates of which are thus completely isolated. Provisions and other needed articles are brought to the houses by special delivery vans and all stores in the area, including grain, are disinfected, so are the vans when they leave the area. The quarantine continues until the area has had no more cases for from four to eight weeks."

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Ches.—Windy Arbour Farm, Nantwich (August 15th); Eaton Villa, Huxley, Chester (August 21st).

Devonshire.—The Castle Hill, Axminster (August 18th).

Essex.—Kirby's Piggeries, Canewdon Road, Ashingdon, Rochford (August 15th).

Glouc.s.—Manor Farm, Tormarton, nr. Chipping Sodbury (August 19th).

Herts.—Three Mile Pond Farm, Sawbridgeworth (August 19th).

Norfolk.—The Aviaries, Blofield Road, Lingwood, Norwich; Mill Farm, Ormesby St. Margaret, Great Yarmouth; West Green Farm, The Piggeries, Poringland, Norwich (August 15th); "Windyridge," Reedham, Norwich (August 18th); Common Farm, Thurne, Great Yarmouth (August 20th); Ashfield House Farm, Mill Road, Reedham, Norwich; High House Farm, Billockby, Great Yarmouth (August 21st).

Renfrewshire.—High Auchinleck, Port Glasgow (August 21st).

Somersetshire.—Gotton Farm, Cheddon, Fitzpaine, Taunton; Langford Farm, Alhampton, nr. Shepton Mallet; Hayne, Corfe, Taunton (August 18th).

Suffolk (E.).—Oak Farm, The Green, Wilby, Brundish, Woodbridge; Willow Farm, Southolt, Diss (August 18th).

Suffolk (W.).—Siam Hall, Newton near Sudbury (August 18th); Church Field, Kettlebaston (August 20th).

Worcs.—Tilesford Farm, Pershore (August 2nd).

Yorks (W.R.).—Kelfield Grange, Thorner, Leeds (August 18th).

FOOT-AND-MOUTH DISEASE:

Glos.—Kirkham Farm, Upper Slaughter, Cheltenham (August 19th); Copsehill Farm, Lower Slaughter, Cheltenham (August 20th).

Kent.—Bagham Farm, Chilham, Canterbury (August 22nd).

Sussex (E.).—Cowlease Farm, Hansey, Lewes (August 20th).

Sussex (W.).—The Brook, Hyde Lane, Upper Beeding, Steyning (August 24th).

FOWL PEST:

Herts.—"Sunny Mead," Gills Hill Lane, Radlett (August 19th).

Isle of Ely.—13, Church Lane, Doddington, March (August 15th); 30, Newgate Street, Doddington, March (August 19th).

SWINE FEVER:

Angus.—Tealing Airfield, Tealing, Dundee (August 20th).

Lincs (Holland).—Glebe Farm, Greetham, Horncastle (August 18th); Wheel Farm, Amber Hill, Boston (August 19th); Rose Cottage, Old Bolingbroke, Spilsby; Toft Tunnel Farm, Hulbert's Bridge, Boston (August 21st).

Midlothian.—13, Holding, Ingliston, Newbridge (August 19th).

Oxon.—The Bakery, Lower Heyford, nr. Bicester (August 22nd).

Salop.—South View, Pontesbury, Shrewsbury (August 19th).

Suffolk.—New Cottages, Lower Holbrook, Ipswich (August 20th).

Worcs.—Hayes Farm, Shrawley, Stourport-on-Severn (August 22nd).

Yorks (W.R.).—Conmades Club, Forge Lane, Oughtibridge, nr. Sheffield (August 20th).

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UNIVERSITY OF LONDON EXAMINATIONS IN VETERINARY SCIENCE

Following is the Pass List for the Second Examination (July, 1952): Abraham, Brian Foskee; Alexander, Thomas John Lyndon; Gibson, Francis Edward Thomas; Nestel, Barry Lionel; Norman, Derek Alfred; Tiffin, Robert Bunting; Walter, Andrew John, and Wells, John Roger, all of the Royal Veterinary College.

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INTERNATIONAL VETERINARY CONGRESSES

Meeting of the Permanent Committee

With the President (Sir Daniel Cabot) in the chair, a meeting of the Permanent Committee for the International Veterinary Congresses was held in Paris on May 17th, 1952.

Early in the proceedings there was some discussion on the place of Congress subsequent to that to be held at Stockholm next year. It was agreed to inform all participating countries that a tentative invitation had been received from the United States of America and to enquire of them if they wished to extend such an invitation from their countries in order that all applications might be considered.

The Financial Reports of the Permanent Committee for the years 1949, 1950 and 1951 having been accepted without discussion, there was a protracted debate on the report on the Congress Fund, from which it appeared that quite a large number of the 35 countries represented on the Permanent Committee failed to pay their dues, which are based on membership of the organisations concerned. It was agreed not only to send the requisite reminders of organisational responsibility in this matter but to seek to stimulate the interest of the individual veterinarian in the proceedings of Congress, by publicising the fact that the reports are available on purchase. "This," said Sir Thomas Dalling, "will stimulate not only the general interest but also the paying of 1s. per year to the Congress Fund."

Dr. Willems (a member of the Congress Fund Committee) then led the discussion on to the consideration of the programmes provided: "Practitioners often tell us that we hold our Congresses in a too scientific and not sufficiently practical sphere." At least one day should be given up to practical demonstrations, as, in fact, was done in Belgium. Others agreed; these including Sir Thomas Dalling, "providing the technical methods which are demonstrated be *new*."

Eventually it was resolved that an endeavour be made to stimulate interest in the International Congresses by (*a*) creating a new membership at a special fee; (*b*) organising demonstrations—which Dr. Alegren thought it just possible, even now, to arrange for the Stockholm Congress.

It was unanimously agreed to recommend the following new members to the Congress in Stockholm: Dr. R. A. Alexander, South Africa; Dr. Hafez Charag el Dine Bey, Egypt; Professor Hakon W. Westermarck, Finland; Professor G. Ramon (France) and Dr. Butozan Vaso (Yugoslavia).

It was agreed that, in future, the statutes of the Permanent Committee and the by-laws of the International Veterinary Congresses should be printed in the *Proceedings*. Sir Thomas Dalling then paid tribute to the important work of the Committee for the Compilation of a List of Animal Diseases, in which is clear from the record of these proceedings that Mr. W. A. Pool, of the Commonwealth Bureau of Animal Health, is taking a key part. Professor Dr. L. de Blieck, the General Secretary of the Permanent Committee, has taken the initiative in reviving the activities of the Committee on the Control of Parasitic Diseases, which, established by the late Dr. Maurice Hall, held only a short meeting during the XIVth Congress.

Further progress was made with arrangements for the sectional meetings at Stockholm, those for the plenary sessions already having been completed and the speakers invited. In regard to the former, there seemed some risk of overlapping with the activities of certain more specialised congresses, now well established: this consideration led to the decision against the introduction of a section for compara-

tive pathology; on the other hand, veterinary pharmaco-therapy is to be added to section 7, after surgery, in accordance with the Zurich resolution.

Consideration of three further items, each of much interest in its own sphere, terminated the meeting. First, a proposal to conduct all correspondence of the Permanent Committee and the Congress Fund in one language. This, while engaging the sympathy of the members, resolved itself into the Chairman's plea—faintly plaintive: "so long as a world language is not in use"—that to facilitate the work of the secretariat members should write as much as possible in French or English, "as these languages are understood by the majority." Next, a proposal, from Turkey, that there be "an international emblem for veterinary surgeons, symbolising veterinary science": truly an intriguing little topic for Stockholm. Thirdly, the reimbursement (up to a certain percentage of their country's contribution?) of the travelling expenses of delegates, on account of the Permanent Commission. The parenthetical question is one of those to be considered in the working out of a scheme to this end.

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The Study of Animal Breeding

In the course of his presidential address to the Society for the Study of Animal Breeding, held in London on April 23rd, Sir Thomas Dalling said that the Society might be regarded by some as too ambitious in covering such a wide field as was embraced by its title: that was not his view. Animal breeding was a subject that had attracted attention for many years, and because of the wonderful powers of observation of some of the practical stalwarts of the livestock industry, types and strains of animals—cattle, horses, sheep, pigs and poultry—had been elaborated and were famous throughout the world. These men and women had what was called "instinct," in that they were able, largely by their powers of observation, to select animals suitable for breeding, whereby the progeny would fulfil the requirements they had set. Success attended many of these efforts—on the other hand, we knew but little of the failures, and they must be many.

Although breeding by what was erroneously termed "artificial" means was, comparatively speaking, a new science, as practised today, it was adopted as a method even in ancient times. Again, those keen observers studied and saw that it might be possible to conduct operations by this method, and although the technique was crude some success resulted. He well remembered his own attempts in horses many years ago, long before artificial vaginas were thought of: collecting semen from one mare and inseminating into another. From these small beginnings the present techniques had been evolved in this and other countries until artificial insemination was being practised successfully in almost all parts of the world. He had been greatly surprised at the rapidity with which this method of breeding had been developed in this country: artificial insemination was available to every farmer in practically all parts of the country. It was a definite success for the profession when it was ruled that artificial insemination activities should be under the supervision of veterinary surgeons: this had paid dividends over and over again.

In some countries veterinarians played an entirely exclusive rôle in A.I. work—not only did they supervise operations, they actually carried out all inseminations. In other countries a minor war was on all the time between veterinarians and others as to the part to be played by veterinarians, and the country was divided on the issue. His own view, after seeing the conditions in a number of countries, was that our method in this country was about right. After all, the act of insemination was a technical job, and with adequate training lay men and women could be used to do this technical work with accuracy and precision—and that was the position here to-day. But the veterinarian had a great responsibility in all this work. It was on his shoulders that the success or failure of the scheme would fall—he had accepted that responsibility and the country looked to him to see that the work in all its aspects would be satisfactorily accomplished. The work undertaken by veterinarians must embrace wider issues than disease control: it must be concerned with animal husbandry in its broad sense, and surely there never was a subject more concerned with animal husbandry than was the breeding of livestock. We had now a golden opportunity to play our rightful part in this important subject and to prove to the world that we were fitted for, and capable of, undertaking this work in all its aspects.

It was encouraging to hear discussions in that Society and to read of the research work carried out by veterinarians on the many problems concerned with animal husbandry—and the problems were numerous. He was one, however, who, no matter how much he respected and admired his profession and would fight for its rights continually, would not agree that we were the only people who should engage in research work on animal problems, including animal breeding. Encouragement must always be given to veterinarians who had the research bent, and we must not discourage the original thinker nor prevent his engaging in all types of work, no matter how fundamental it might be. On the other hand, we had much to learn from those engaged in research work in other branches of science. Let us fully grasp and welcome opportunities coming our way, profiting by and applying the results of scientific research work in its broadest aspects and encouraging these specialist workers to assist us in our own problems. His experience over many years was that workers in all branches of science would welcome the opportunity to collaborate with us, and would place at our disposal whatever knowledge they had. But, again, he was convinced that for our problems we must have leaders who were veterinarians, who must "head" the teams of workers—we must lay down the principles and the problems and bring to our aid whoever could help us. Without the guidance of veterinarians with vision and foresight, without experience and leadership, research work concerning livestock health, disease and husbandry would surely fall short of the ideals to which it might reach.

"I have for some considerable time," continued Sir Thomas, "been uneasy about the future of those of us who have elected to devote our whole time to artificial insemination work. True there is a considerable amount to do in running an artificial insemination centre—true we can, if we are so minded, fall into the way of merely running the centre from day to day. That, in my view, will result in the development of veterinarians who are forgetting their calling and training—it will produce veterinarians who are not fulfilling their obligations to the profession—it will result in attracting to artificial insemination and breeding work the wrong type of veterinarian. As I go over the world I see very clearly the need for active, progressive veterinarians, and I am satisfied that ambitious and young veterinary surgeons must be encouraged. In livestock breeding we must play a more essential part than supervising the work of others and running an artificial insemination centre. I feel that, coupled with breeding activities, there is a golden opportunity to include the many problems that give rise to infertility." We could not be proud of our breeding records, no matter how good we tried to convince ourselves and others they might be. Even the so-called normal results must be capable of being improved. The world to-day was crying out for more and more livestock to meet the ever-increasing demands for food of animal origin. Disease control would take care of part of the difficulties in increasing numbers of livestock: increased fertility would be accorded its due place in this work. Those who had chosen to pursue a career in animal breeding must be given the opportunity of studying further with the provision of the necessary facilities. "Veterinarians engaged in this work can be classed into different groups—there are those who have the true research outlook and are happy in work on the bench in the laboratory; their work on semen and semen production is to be encouraged—there are those who delight in field work, who are happy in studying what is happening in the various stages of conception and pregnancy. Ample opportunities present themselves in the many thousands of cattle with which their work brings them into contact. There are those who are keenly interested in problems of fertility and infertility in both sexes; opportunities may arise for them in the so-called 'problem herds' and in the individual animal which continues to give trouble. In an organisation which is country-wide there must be ample scope for the activities of all classes." He would like to see an arrangement whereby all interests were linked and all aspects of fertility and infertility were being studied. Artificial insemination centres, properly linked, could provide all the facilities and encouragement required. Different aspects of the subjects could be studied by different people in different centres, the whole being related to one another and correlated by a centralised group. With the development of artificial insemination throughout the country the opportunity was now presented for a concerted effort for intensive study. That Society could, in his view, do much to foster such concerted effort and he suggested to them that they set about considering how this could be done. He would like to see this country give a lead to the world in organising a plan of work on the study of fertility and infertility in livestock—a concerted plan, based on artificial insemination activities, a plan that could be emulated by veterinarians in other parts of the world. "Many parts of the world still look to this country for guidance and inspiration. It would make many of us very happy and lighten our task in international affairs if we could point to this country as an example of how to organise a plan for such a study in which veterinarians are playing a leading part."

Veterinary surgeons in practice also had their part to play in a programme such as he had outlined. "They cannot, of course, devote the time as you people can. They can, however, facilitate the work we envisage by providing facilities for carrying out suggested treatments, and by noting observations which they can pass on. The veterinary surgeon in practice should be the friend and

close companion of the investigator, for it is on him that will fall the duty of applying any results that may accrue from such a plan. I know full well that difficulties may arise here—I realise that there may be suspicions that trespassing is occurring; with good will and full confidence, however, such difficulties can surely be overcome. Had it not been for the activities of a few during the war days many of the veterinary surgeons in practice to-day would not have been in a position to deal with infertility to the extent to which they now practise its control. Those early pioneers have, in my view, never had the recognition they deserve. You are their successors and we are looking to you for advancement in our knowledge."

The activities of that Society should not, in his view, be confined to the discussion of the results of work and views of its members, nor to the discussion of the work of specialists. It could do a further grand job of work if it would give consideration to a scheme for joint action on fertility and infertility problems.

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GROWTH OF AUSTRALIAN VETERINARY RESEARCH

In the course of his presidential address to Section L (Veterinary Science) at last year's annual meeting of the A.N.Z.A.A.S., Professor R. M. C. Gunn said that he thought it fitting, during a year in which the Jubilee of federation was being celebrated, that he should begin by briefly reviewing the progress of veterinary science in Australia since the establishment of the Commonwealth 50 years ago. He pointed out that it was a cause for pride in our profession that veterinary science was one of the early sections of the Association to be established. For this we should thank many of the early leaders of the profession in Australia, outstanding amongst whom were emeritus Professor J. D. Stewart, Dr. J. A. Gilruth, Professor H. A. Woodruff, Mr. Max Henry and Dr. W. A. N. Robertson. Their achievement was the more remarkable when it was remembered that the total number of qualified veterinary surgeons in the whole Commonwealth at the beginning of the century was less than 20. At that time State Veterinary Associations were struggling for their existence and Universities in Australia had not commenced teaching veterinary science, although there had been a private school existing in Melbourne since 1888. "To-day we have some 500 graduate veterinarians in the country, a flourishing veterinary science section of A.N.Z.A.A.S., a powerful Australia-wide Veterinary Association and two progressive University Faculties teaching veterinary medicine to overflowing classes." The President traced the development of veterinary education in Australia, starting with Kendall's College in Melbourne which was succeeded by and, in fact taken over by the Veterinary Faculty of Melbourne University in 1909, until its closure in 1929. It was in 1909, also, that the new Department of Veterinary Science was created within the University of Sydney, while the Queensland Veterinary School was established in 1936 and now shared with the Sydney School the task of providing most of the veterinary surgeons for Australia and New Zealand.

Research was negligible in the early years of the century but became first established at the veterinary schools. It was shortly afterwards strengthened by the establishment of research institutes such as that at the Glenfield Government Research Station in New South Wales, the Weribee Research Farm in Victoria, the Yeerongpilly and Townsville Research Stations in Queensland, the Medical and Veterinary Research Institute in Adelaide and, still later, the veterinary research laboratories and field stations of the Commonwealth Scientific and Industrial Research Organisation.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

ANTRYCIDE AND THE FUTURE OF TRYPANOSOMIASIS OF CATTLE

Sir,—Since publication of my paper under reference, I have received a letter from Mr. L. E. W. Bevan, M.R.C.V.S., in which he suggests that I may not be acquainted with his work on the maintenance of cattle in tsetse country by the use of drugs to develop tolerance. My address to the Kabete research club made no attempt at an historical review. I am, of course, well acquainted with the valuable work done by Mr. Bevan in Southern Rhodesia (*Trans. Roy. Soc. Trop. Med. Hyg.* **22,** 147 and **30**, 199) and hasten to ask if you will permit me to draw attention to his pioneer work through the medium of your columns.

In the same paper, I stated that I could lend copies of the antrycide report to persons interested. This sentence should have been deleted before the typescript was sent for publication. The work was financed by the Colonial Office and this report to the Secretary of State for the Colonies could not be lent, outside the immediate circle of my colleagues at Kabete, without his permission. The question of publication is being considered at the Colonial Office and it is hoped that means may be found whereby the material will be made available. I shall be very grateful if this correction may be published as soon as possible.—Yours faithfully, R. N. Fiennes, East African Veterinary Research Organisation, Veterinary Research Laboratory, P.O. Kabete, Kenya. *August 15th,* 1952.

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DEEP FREEZE PRESERVATION OF SEMEN

Sir,—It may be of interest to readers to know that using the Deep Freeze technique described by Polge and Rowson* pregnancies have been obtained with bull semen after seven months storage at −79° C. Semen examined after nine months at this temperature appears perfectly active and normal.—Yours faithfully, L. E. Rowson, Cambridge & District Cattle Breeders, Ltd., The Gravel Pits, Huntingdon Road, Cambridge. *August 25th,* 1952.

Nature*. **169. 626 (April 12th, 1952).

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POST-GRADUATE TRAINING

Sir,—I read with great interest Mr. D. D. Ogilvie's letter on the above subject appearing in your issue of August 9th, 1952.

I fully endorse all the views expressed by him and in particular about the influence of British Veterinary Science on those of us who are from the tropical countries. In future years it may be that Asian students will not feel the need to come to Britain for undergraduate veterinary studies because of facilities available for such training in their own universities but I am sure there will be a definite influx of Asian graduates for post-graduate training in tropical veterinary medicine.

Since Britain is the first place of choice for us for any post-graduate work, it will indeed be a great and generous step if a course of instruction and a qualification in tropical veterinary medicine is reintroduced in the universities of this country. The value of such a course of instruction will be enhanced greatly if the members of the teaching staff are drawn from those British veterinarians who had taught or worked in the tropics and from the veterinary teaching staff of the universities of some of the tropical countries as well.

I believe during the pre-war years, the course of instruction for the diploma of D.T.V.M. was open only to students with an M.R.C.V.S. diploma. If these courses are reinstituted, however, and if it is the desire to benefit and attract Asian or other graduates, the course should be open to graduates of recognised universities in the tropics.

I hope the veterinary education authorities in this country will give this matter their serious consideration as it is one of the ways of helping the under-developed countries to produce more food and establish a sound animal industry.—Yours faithfully, C. Perumal Pillai, D.V.M., M.R.C.V.S., Ministry of Agriculture, Peradeniya, Ceylon, at Elmcroft School, Goring-on-Thames, Oxon. *August 23rd,* 1952.

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THAT SLANG TERM "VET."

Sir,—I have been reading with a certain amount of amusement not unmixed with annoyance, the letters in *The Veterinary Record* on the widely used term "Vet." from those who are anxious to abolish this vulgar "slang term."

Personally, I have always looked upon this as a friendly abbreviation of a rather cumbersome title and have never considered it as in any way derogatory. I am quite certain that the vast majority of the public who use the term, have no intention of being in the least offensive. Upon the few occasions when I have been addressed as "doctor"—usually by foreigners—instead of being elated, I can remember a feeling of being distinctly annoyed.

The term being "vetted" is applied to all sorts and conditions of things in life and is looked upon by those who use it as the hallmark of efficiency. Only a few days ago I was speaking to a man who had purchased a second-hand car: he said, "Mind you, I had it vetted first." I felt quite proud of the expression. If he had said, "Mind you, I think it has been 'doctored'," I should have known at once that he had his suspicions.

In conclusion, may I quote the words of a famous Scot, written many many years ago. Words which we might all do well to ponder over and which could do more to raise the status of our profession—as some seem to consider necessary—than any title conferred upon us by those responsible.

"The rank is but the guinea's stamp, the man's the goud for a' that."—Yours faithfully, R. E. S. Tuckey, St. Mary's House, Whitchurch, Shropshire. *August 23rd,* 1952.